CLAIMS

What we claim as our invention is the following:

1. A composite forming fabric comprising a paper side layer having a paper side surface, a machine side layer having a bottom wear side surface, and a plurality of pairs of first and second intrinsic, interchanging weft yarns at least interweaving with the paper side layer, wherein:
the paper side layer and the machine side layer each comprise warp yarns and non-interchanging weft yarns woven together;
said paper side layer and said machine side layer each having a predetermined repeat of the weave pattern in the cross-machine direction;
at least one of said plurality of pairs of first and second intrinsic, interchanging weft yarns having at least four segments in the paper side layer within each repeat of the weave pattern, said segments providing an unbroken weft path in the paper side surface, with each succeeding segment being separated in the paper side surface of the paper side layer by at least one paper side layer transitional warp yarn.

2. A composite forming fabric according to claim 1, wherein at least one segment has a different length from the other segments.

3. A composite forming fabric according to one of the preceding claims, wherein the yarns of said intrinsic, interchanging weft pairs are both binder wefts or top wefts or only one of such interchanging yarns is a binder or a top weft.

4. A composite forming fabric according to one of the preceding claims, wherein the paper side layer comprise warp yarns, interchanging weft yarn pairs and non-interchanging weft yarns woven together.

5. A composite forming fabric according to one of the preceding claims, wherein said interchanging intrinsic weft yarn pairs are disposed between adjacent pairs of paper side weft yarns.

6. A composite forming fabric according to claim 3, wherein the paper side layer only comprise warp yarns and interchanging weft yarn pairs woven together.

7. A composite forming fabric according to one of the preceding claims, wherein each of said first and second intrinsic, interchanging weft binder yarns of each pair of yarns having at least four segments in the paper side layer within each repeat of the weave pattern binds to at least one warp yarn in the machine side layer vertically underlying one of said segments.

8. A composite forming fabric according to one of the preceding claims, wherein at least one of the paper side segment sub-layers has no interlacing between either

member of said intrinsic interchanging weft binder pair and the machine side warp yarns.

9. A composite forming fabric according to one of the preceding claims, wherein at least two or all of said at least four segments per weave repeat have underlying sub-surface binder yarn and wear side warp yarn interlacing.

10. A composite forming fabric according to one of the preceding claims, wherein per weave repeat said pairs of intrinsic, interchanging weft binder yarns bind to a single wear side warp yarn in regions underlying two segments.

11. A composite forming fabric according to one of the preceding claims, wherein the weave repeat includes two adjacent segments that are free of any underlying, bound wear side warp yarns.

12. A composite forming fabric according to one of the preceding claims, wherein all of said pairs of intrinsic, interchanging weft binder yarns having at least four segments in the paper side layer within each repeat of the weave pattern.

13. A composite forming fabric according to one of the preceding claims, wherein the second member of said pair of intrinsic interchanging binder yarns per weave repeat has less segment underlying sub-surface binder yarn and wear side warp

yarn interlacing as the first member of said pair of intrinsic interchanging binder yarns.

14. A composite forming fabric according to one of the preceding claims, wherein the second member of said pair of intrinsic interchanging pair per weave repeat binds under less segments with wear side warp yarns than the fist member of said pair.

15. A composite forming fabric according to one of the preceding claims, wherein some intrinsic interchanging weft yarn pair have a different number of segments within each weave repeat.

16. A composite forming fabric according to one of the preceding claims, wherein at least one of said binders of said pair of interchanging intrinsic pair floats between the paper side and machine side warp yarns in the region of a segment created by the other binder of said pair.

17. A composite forming fabric according to one of the preceding claims, wherein the fabric has a weave repeat comprising 24 warp yarns or more.

18. A composite forming fabric according to one of the preceding claims, wherein the fabric has a paper side to machine side warp yarn ration of 1:1, 3:2, 2:1 or higher.